

# ATGLANT ENGINEERING READINESS

## NEWSLETTER 2-01

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# Director's Comments

While some things change, others remain the same. At N43, the recent changes include turnovers of the Director and Deputy Director billets. CAPT Russ "TJ" Tjepkema recently departed to start his pipeline for his next tour as Commanding Officer of USS NASSAU (LHA 4) and CAPT Jim Miller retires and starts his next career in July. He has been relieved by CAPT Doug MacCrea, who moves up from the Gas Turbine Branch Head. The turnover process was very thorough and gracious and I would like to thank them all for getting me up to speed quickly.

TJ and Jim were the architects of the changes in the engineering qualification process that were implemented during the transition from the CINCLANTFLT PEB to ATGLANT N43. If you have been away from the waterfront for the last few years, you'll find that the atmosphere of the "getting ready for OPPE" mentality has been replaced with a steady strain approach that leaves the ship with a series of reports which emphasize material condition observations and training objectives. Unlike the old days, distribution of the reports is limited primarily to the ships and their ISICs. The process, as it exists now, is the best it has ever been, with the emphasis on the ships getting their engineers up to speed early in the training cycle as the ship leaves its maintenance period and becomes operational. In addition to our formal visits and help from the Regional ATGs, if our schedule permits we can provide mentor visits upon request from your ISIC to help your engineers focus on problem areas.

TJ and I met the first time in 1986 when he was a space assessor on the PEB and I was a chief engineer trying to nurse a 28 year old 1200psi DDG through an outchop OPPE. We have had several occasions during our turnover here to reflect on the differences between then and now. Although the standards and the principles of good engineering practice remain the same, how we train and assess is a much different, much improved process. At the risk of sounding trite, we really are here to help.

E. S. Yerger

# Deputy Director's Farewell

After nearly four years as Deputy Director with ATGLANT N43/PEB the time has come for me to move on. I will miss seeing all of you on the deckplates. It has been a great time of transition to a newer and better way of doing things. I enjoy being a helper rather than an inspector and I like the reception we get on the deckplates as we try to help you assess your state of engineering readiness versus inspecting you for a grade.

CAPT Doug MacCrea has relieved me and, having been here almost as long as I have, he will carry on the traditions and uphold the standards we have all fought so hard over the last couple of years to put into place. Remember, we want to help you, however we cannot grade you. We are all career engineers and we remember where we came from. Call us, email us, or stop by. There will always be someone to answer your questions, or just to chat with about things related to engineering or damage control.

Fair winds and following seas to all of you as I head off into retirement.

CAPT J. R. Miller

# MANAGEMENT

## CONCERNS REGARDING SUBMISSION OF EOSS FEEDBACKS

By CAPT Jim Miller

EOSS is installed on approximately 225 surface ships. NSWCCD code 943 is responsible for the life cycle maintenance of EOSS which includes initial generation, updates for authorized SHIPALTs, and resolution of technical feedback issues. Lately, a disturbing trend regarding the generation and submission of EOSS/OSS technical feedbacks has been observed.

One of the foundations of the EOSS/OSS Program has always been Fleet involvement in the process. The shore-based technical community is responsible for generating technically correct, properly sequenced EOSS/OSS procedures and diagrams and for maintaining them current throughout the ship's life cycle. However, it is incumbent on each ship to participate in the process. It is ship's force responsibility to use the documents each time they align, start-up, operate and secure the systems and equipment covered by EOSS/OSS. If the ship finds a mistake in the procedures or diagrams, they are required by OPNAV Instruction and TYCOM directives to make the shore-based technical community aware of this mistake so that it can be investigated, resolved and if necessary, the document(s) corrected. These corrections may not only apply to the ship reporting the problem, but for all ships that hold this document or a similar one.

The EOSS User's Guide allows the ship's CO to **temporarily** authorize a deviation from EOSS/OSS but only with the provision that a technical feedback be submitted to NSWCCD SSES for resolution. It was never intended that the CO's authorized change become permanent. Only the shore based technical community can make the final binding decision regarding a technical issue. To make that decision, they must be made aware of the problem. The feedback process provides the vehicle for submitting problems with documents for resolution by NSWCCD SSES. It benefits you and your ship and all other ships that may have the same problem but have not discovered it. Detailed guidance on how to submit EOSS feedbacks may be found in Chapter 6 of the EOSS User's Guide, EUG/0001/082400.

Ships are **encouraged** to use their EOSS/OSS procedures and diagrams and to generate and submit technical feedbacks. The feedback system can also be used to ask questions of NSWCCD SSES.

The average number of EOSS/OSS feedbacks submitted per ship per year has declined over the past ten years from 28/ship/year in 1988 to 9/ship/year in 2000. There are several theories for the decline in this number:

- The EOSS program is more mature and as such is more accurate.
- Ships force is more familiar with EOSS and its use
- The demise of PEB as a "forcing function" for shipboard use of EOSS/OSS

The average response time of NSWCCD has improved from 23 working days in 1988 to 19 working days in 2000 (17%). In addition, the percent of feedbacks answered "on time" (21 working days or less in-house) has increased from 65% in 1988 to over 85% in 2000.

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## TAGOUT

By LCDR R.T. Lawrence

Ref: (a) NAVSEA S0400-AD-URM-010/TUM  
(Tag-out Users Manual)

Now that reference (a) is in effect, here are some good topics to consider using when conducting training of ship's personnel on the new Manual:

- Partial-clearing of tags
- Adding tags
- Tag-out Audits
- Iterative Tag-outs

Many times the first three processes are tied together and jeopardize worker and equipment safety. A typical scenario starts with a tag-out written to cover a work item on a piece of equipment. After the tag-out is written and hung, some work is performed, but testing is required to verify operation of a portion of the system (hydro etc.). This requires that certain tags be cleared-- but not all. The mistake is made when the authorizing officer is asked to and signs block 20 of the Tag-Out Record Sheet to clear tags on

specific components for testing. What has essentially happened is that he has cleared tags on a work item that has not been completed. That is, the tag-out as written and twice verified for that particular work item has now been violated. The original isolation that was tagged is no longer in effect.

The proper procedure for partial clearing of tags in the above scenario is discussed in reference (a) section 1.8.2. On the same Tag Out Record Sheet, a new work item must be written which essentially says, "these are the tags that must be hanging to safely perform the work/testing on this system." Two verifications are required, just as in any work item and the tags used are listed for the work item in block 5 of the Tag-Out Record Sheet. Lining out and initialing tags listed in the old work item is not acceptable. When the new work item is approved, the old work item can be cleared and whatever tags are not required for the new work item can be cleared.

The same procedure must be used when adding tags, in the example above it would apply when additional tags are hung on components previously untagged to perform the test. It could also apply if another, separate job is started on the same system which eliminates the need for writing another separate tag-out. Specifically, a new work item must be written, and verified even if the components tagged are identical to the original work item.

Care must be given to partial clearing tags when an outside Repair Activity is involved because a representative must concur on each work item started and cleared and each tag hung and cleared.

The EOOW or EDO supervising tag-out audits should be trained to look for improperly cleared tag-outs as discussed and other mistakes. While watchstanders verify that tags are properly hung, supervisory personnel i.e. a designated authorizing officer, should review the tag-out log for administrative discrepancies.

Finally, a process for Iterative Tag-outs is included in reference (a). A convenient example for application of this process is burner-front checks on steam ships. For those not familiar with the PMS, all burner root valves are tagged

shut and each root valve is sequentially untagged and re-tagged as its respective burner is checked for leakage. This normally required the presence of the EOOW or EDO to sign as each tag was cleared and added or a runner to shuttle from burner front to Central Control for each tag removed and hung which made the process cumbersome and invited watchstanders to take shortcuts. Using the iterative tag-out process contained in section 1.6.8 of reference (a), a work item is written for each burner and a designated on-scene authorizing officer (designation may be made by either name or watch station) can sign for all actions except final clearance of the tag-out. The Authorizing Officer must be notified when isolating and unisolating equipment and must sign for the final clearance of the tag-out.

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### **GAUGE CALIBRATION**

By LCDR Joe "Wesley" Hyde

- Ref: (a) CLF/CPFINST 4790.3 VOL IV CH-4 (JFMM)  
(b) CNSL 161337Z AUG 00

The primary guidance for establishing a Shipboard Gauge Calibration program is found in reference (a). Reference (b) reiterates the importance of not only maintaining a high percentage of calibrated instruments but also the criticality of reporting this percentage.

Recently, it has been noted that ships are allowing a significant number of calibrated instruments to lapse beyond their calibration periodicity. Another common observation is that a gauge in one plant will be calibrated and the corresponding gauge in the other plant will have a No Calibration Required (NCR) sticker.

The following suggestions will help you in getting your gage calibration program up to required standards:

- Conduct training on Part I Chapter 12 section of the JFMM (ref a). Highlights include, but are not limited to, emphasizing department head involvement, using the prescribed periodicity parameters when calibrating instruments, and tailoring the ship's Critical

Requirements List (CRL)/Critical Instruments List (CIL) using the decision tree in the JFMM.

- Periodically review the CNSL website ([www.cnsl.spear.navy.mil](http://www.cnsl.spear.navy.mil)). Useful information includes your currently reported readiness percentage, your SISCAL status, a database of calibration messages, and a sample gauge calibration instruction. The stated goal in this website is "Shipboard calibration coordinators should attempt to maintain a minimum of 80% as a baseline and 90% or greater prior to deployment."
- Check the US Navy Metrology Website (<http://metrology.corona.navy.mil/index.htm>) for the most current technical guidance and metrology bulletins. This website requires you to acquire a password prior to accessing their database.
- Train each level of watchstander by conducting frequent supervisory tours of the engineering plant. This can be the most beneficial practice in recognizing gauge calibration deficiencies.
- Be proactive in the tracking of calibration periodicities as well as the scheduling of SISCAL visits. Inter-departmental cooperation is essential in reviewing the optempo of the long-range schedule.

An effective and properly managed (steady strain vs. ramping up) gauge calibration will help ensure that the engineering plant will perform as designed during both normal operating conditions as well as casualty situations.

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#### **ENGINEERING LOG REVIEW**

By LCDR Curtis Lenderman

Ref: (a) NSTM 090

The Engineering Log should provide all information necessary to reconstruct significant events within the engineering plant. As a legal document, it is essential that the Engineering Log provide accurate and complete information. Reference (a) provides guidance as to specific information that must be included in the daily log. Additionally, Addendum A is provided to assist you in your daily review, and can also be used as a training tool for your EOOWs.

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#### **TEMPORARY STANDING ORDERS**

By LCDR Dan Lane

Ref: (a) COMNAVSURFLANT/PACINST 3540.22, EDORM

Per reference (a) Special Operating Orders (commonly called Temporary Standing Orders) are primarily used to address procedural changes or operating limitations posed by material or systems monitoring deficiencies within the plant or its supporting auxiliary systems. They provide interim guidance for safely operating effected equipment or systems until the limitation can be corrected and must be signed by the Commanding Officer.

Paragraph 3203 of reference (a) provides a more detailed description of those situations where a Special Operating Order may be warranted. Some examples are to authorize manual operation of regulators/valves during repair to their automatic functions or to use back-up power sources until the normal source is replaced or repaired.

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# MATERIAL/ TECHNICAL

## GAS TURBINE

### FFG-7 REVERSE POWER RELAYS

By LCDR Pierre Fuller

Ref: (a) MIP 3112/002 -60

Note 5 of reference (a) states that FFG7 ships that have had the SSDG over-power monitors installed should omit the MRCs A-6R or A-13R, whichever is applicable. These PMS checks are for testing the reverse power relays and have nothing to do with this MACHALT. This has been brought to the attention of the Division of Propulsion and Power Systems Branch in Philadelphia and they agreed that the Reverse Power Relay test should not have been deleted. A formal resolution is expected soon in the form of a change to the MIP.

The reverse power relay is a safety feature designed to protect the prime mover from damage if in the event a reverse powering situation. The periodic testing of this feature is essential to the safe operation of the SSDGs.

It is strongly recommended that all FFG 7 Engineers review their PMS to ensure that this important check has not been deleted.

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### POWER TURBINE BRAKE PERMISSIVES ON DD-963 CLASS SHIPS

By LCDR Mike Steen

Ref: (a) NAVSEA Technical Manual 0942-LP-016-0010 "Speed Decreaser for DD 963 Class Ships"  
(b) FTSC LANT NORFOLK VA message 031335ZAPR01

In accordance with reference (a), there are three Brake Control (formerly Control Air System (COAS)) permissives external to the Propulsion Control System that must be met before the power turbine brake can engage:

- Brake Control air pressure not less than 95 psi
- Lube oil pressure not less than 15 psi
- Lube oil temperature not greater than 130 degrees Fahrenheit

When an operator depresses the brake "on" pushbutton and a brake "on" command is issued by the ECSS, if any one of these permissives are not met, the brake will not engage. However, there is a danger that the brake, which is still "armed", will engage when the missing permissive is met regardless of power turbine speed. To prevent this the operator must initiate a manual brake "off" command to disarm the power turbine brake when a failure to engage is observed.

An ECP was developed to alert the operator to a missing permissive (ECP G0026, Backplane Wiring Modification) by means of a flashing brake "on" indicator light. This alerts the operator to cancel the brake "on" command by manually initiating a brake "off" command. This disarms the power turbine brake and will prevent the engagement of the brake until the unmet permissive is identified and corrected.

Per reference (b), FTSC LANT Norfolk has identified the absence of ECP G0026 on at least one LANTFLEET DD-963 class ship. A simple way to check if the ECP has been installed on your ship is to attempt to engage the power turbine brake with the MRG lube oil system secured (less than 15 psi). If the "PT Brake On" pushbutton does not flash, then either the ECP is not installed or is not operating properly.

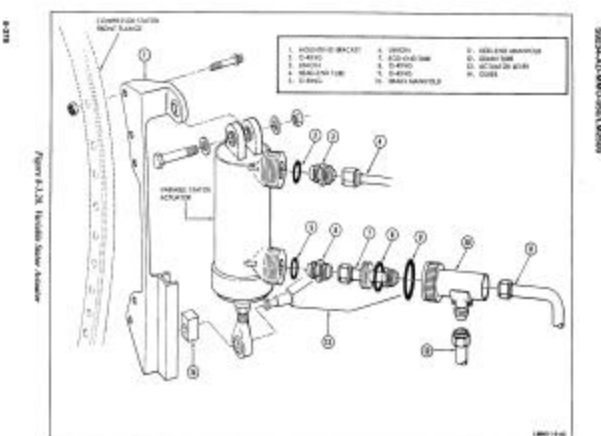
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### LM 2500 VSV ACTUATORS

By LCDR WEICKSEL

Ref: (a) LM 2500 TECHMAN

Discovery of worn VSV Actuator spherical bearings is becoming more common during material assessments. This phenomenon has also been observed by the fleet's MGTIs when performing LM 2500 Gas Turbine inspections. As noted on the diagram below, the spherical bearing is the device that extends below the variable stator actuator. The actuator lever (13) is inserted through the VSV actuator spherical bearing into a carbon guide block (14). Excessive axial wear of the spherical bearing causes misalignment and premature wear of the guide block resulting in misalignment of the entire VSV actuator lever. You can check for wear by attempting to move the VSV actuator levers up and down. If you observe any movement, have a MGTI check it to see if the wear falls into the criteria outline in reference (a).



## STEAM

### STEAM PLANT ERRATA--CERVs

In the last Newsletter, an article was written discussing common problems with Combined Exhaust Relief Valves (CERV). Master Chief

Furey from COMPHIBGRU TWO identified an additional important item that it is not mentioned in NSTM 505. He pointed out that installation of the wrong sized handwheel or incorrect use of spacers in CERVs can cause improper seating of the main disc on its seat essentially gagging the relief feature of the valve. Specifically, using a handwheel of smaller height than designed will allow the main stem to travel farther than it should and where the disc would normally lift against spring pressure, it cannot do so because the main valve stem is pressed against it.

Conversely, if the handwheel does not permit the seat to travel far enough, the main disc might not seat sufficiently. This would cause the Auxiliary Exhaust System to pressurize the turbine.

These are other items in addition to those mentioned in the previous issue to look for when examining CERVs and include in watchstander training.

## OPERATIONS

### POSTSTART CHECKS FOR MHC DIESEL ENGINES

By LCDR Chuck Smith

Ref: (a) CASSDG/0007/021800 for MHC 51 Class.  
(b) CAMDS/0015/103199 for MHC-51 Class.

This article provides suggestions for conducting effective post-start inspections of MHC Isotta-Fraschini engines, and is intended to supplement, rather than supersede, the guidance contained in reference (a) and (b).

A thorough inspection of SSDGs and MPDEs following startup, both at the engine and on the SSQ-109 system, should be conducted immediately after starting the engine as well as periodically throughout the watch. Some things to check include:

For the EOOW/MCCO:

- Following a normal start, and while engine is at idle, observe the MPDE/SSDG STATUS page. Verify engine speed is between 700 and 800 RPMs and all other engine parameters are within limits.
- Observe the ENGINE DATA, LUBE OIL, WATER COOLING, and EXHAUST TEMP pages to ensure all parameters are within limits.
- When Rover reports results of post start inspection, and jacket water temperature is 113 degrees or higher, bring engine to ASSUME POWER speed IAW applicable EOP.
- For a MPDE start, observe the IFVG LUBE OIL page. Verify that the IFVG scoop tube retracts fully and that shaft begins to spin.
- Note: Some MHCs have a problem with the shaft breaking free when engines are brought to ASSUME POWER speed. Does your ship have a TSO or local procedure directing watchstanders on what actions to take should this occur?
- Verify all engine parameters (including IFVG and VSP parameters for a MPDE) are within specifications. For MPDEs, verify that IFVG lube oil standby pump and VSP control oil and lube oil standby pumps have shut down.

Post start checks for the Rover:

- With engine at idle speed, inspect for lube and fuel oil leaks. Pay particular attention to engine "vee" and turbocharger drain lines. A flashlight and inspection mirror may be required to inspect the "vee"
- Inspect governor actuator for oil leakage or evidence of an excessively loose linkage.
- Listen for unusual noises from the engine or clutch housing/generator coupling (as applicable)
- Inspect the engine rear seal/clutch seal (as applicable) for evidence of oil leakage.
- Inspect drive belts to seawater pump to ensure proper operation. Inspect jacket water expansion tank level, verify it is 1/2 to 3/4 full.
- Inspect salt water piping for leakage.
- Report status of post start inspection to EOOW. Stand by while engine comes to ASSUME POWER speed.
- For MPDEs, verify scoop tube has retracted and shaft is turning.

- Repeat inspection of engine for leaks and unusual noises.
- Verify proper operation of seawater thermostatic recirc valve, if installed.
- Inspect and record manometer readings.
- Inspect UCHS and VSP rooms for unusual noises or oil leaks. Inspect line shaft bearings for proper oil flow and leaks around shaft seals.
- Immediately report any unusual noises, vibrations or leaks to the EOOW.

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### **POST-START CHECKS FOR MCM IF DIESEL ENGINES**

By LCDR Dan Harris

Ref: (a) MEDA/0254/112500 for MCM 3-14.  
(b) SSDS/0484/030100 for MCM-3-14.  
(c) MCM Class Advisory 13E-92

The following is a suggestion for conducting effective post-start inspections of MCM Isotta-Franchini engines, and is intended to supplement, rather than supercede, the guidance contained in references (a) through (c).

#### **Post-Start Checks**

- PCCO/PACC ensure that the engine is operating at idle speed and that all other engine parameters are within specified limits per EOP
- MMRO place all alarms in the "normal" position and verify that all local parameters are within specification. Verify that the engine is free of any FO leaks and that any LO leaks present are manageable. The presence of any FO leaks will require that the engine be secured and corrective maintenance action taken. Special attention and care should be given to an inspection of the engine "V" as the FO injection pump drive shaft is spinning at a very high speed. Use of an inspection mirror is encouraged to conduct this check.
- Verify that the engine LO sump level is between "MIN" and "MAX" on the dipstick. This check must be conducted while the

engine is at idle speed to ensure that an accurate sump level is read.

- Inspect governor actuator for oil leakage or evidence of an excessively loose linkage.
- Check for exhaust leaks on the exhaust manifolds, turbochargers, and the engine exhaust piping.
- Listen for unusual noises from the engine or clutch assembly/generator coupling (as applicable).
- Inspect drive belts to the seawater pump to ensure proper operation and verify jacket water expansion tank level.
- Inspect salt water piping for leakage.
- Report status of post-start inspection to EOOW and standby to conduct a quick visual and audible inspection of the engine after it is loaded. Immediately report any unusual noises, vibrations or leaks to the EOOW.

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### **POSTSTART CHECKS FOR COLT-PIELSTICK DIESEL ENGINES**

By LCDR Dan Lane, ENCM (SW) Benedicto  
and ENCS(SW) Leppelman

Ref: (a) NAVSEA S9233-A8-MMO-010, Main Propulsion Diesel Engine Maintenance Procedures  
(b) CMEA/0066/051399 for LSD-41/49 Class.  
(c) MEDA/0295/1110198 for LSD-41/49 Class.

Sections 2.5 and 2.6 of reference (a) contain detailed pre-start checks for Colt-Pielstick Main Propulsion Diesel Engines (MPDE's). This article provides suggestions for conducting effective post-start inspections of these engines.

A thorough visual inspection of the MPDE and its support systems should be conducted on both levels immediately after starting the engine as well as periodically throughout the watch. Look for fuel, lube oil, exhaust gas and cooling water leaks. A flashlight, clean rags and an inspection mirror can make this task easier.

- Start air should have shut off at the normal preset (typically 80-90) RPM to prevent excess air flask pressure loss.
- Verify that the pressures and temperatures of the various fuel, oil and water cooling systems at the Local Operating Station are normal for the operating conditions and report them to the EOOW.
- Verify that the exhaust temperatures are normal and nearly equal for all cylinders. Check abnormal temperatures using reference (a), Table 5-1.
- The Enclosed Operating Station Console operator should also check fuel, lube oil and cooling water system pressures and temperatures IAW reference (b).

For the physical inspection of the engine:

- Immediately report any unusual noises, vibrations or other indications to the EOOW.
- Start the inspection at the left-bank turbocharger on the upper level:
- Verify turbocharger lube oil flow in all sight-glasses IAW step 6 of reference (b). In accordance with references (b) and (c), the engine **MUST BE STOPPED** if the LOS Operator observes **NO FLOW**.
- Proceed to the right bank turbocharger and repeat step 1 for it.
- Proceed around the engine in a 360-degree clockwise arc (as seen from above) on the upper level.
- Be alert for unusual smells that would indicate fuel, exhaust or lube oil leaks.
- Look for exhaust leaks at the Turbochargers and along The Exhaust Manifold. Exhaust leaks often occur at the expansion joint gaskets and the exhaust manifold end bell
- Continue along the right-bank cylinders visually inspecting each cylinder head and valve cover for evidence of leakage or loose components.
- Look for jacket water leaks at the flex hoses from the cylinders to both the inlet and outlet JW headers. Check JW expansion tank level (normally between  $\frac{1}{2}$  and  $\frac{3}{4}$ ).
- Proceed along the left bank toward its turbocharger, repeating steps 3-6 for its cylinders.
- Proceed to the lower level and continue beneath the left bank turbocharger:

- If running, check the engine standby lube oil, rocker lube oil, fuel and cooling water pumps for leakage and evidence of malfunction.
- Check the duplex lube oil strainer for leaks. Check the lube oil cooler for leaks.
- Inspect the attached fuel oil and lube Oil pumps for leaks.
- Inspect the governor for leaks. Verify that the governor control lube oil sight-glass is filled IAW PMS and that the indicated rack setting corresponds to engine load.
- Check for fuel leaks from the fuel inlet and return headers.
- Check the fuel leak-off sight-flow indicators for excessive leak-off or pooling fuel.
- Inspect the cylinder fuel oil pump-to- header pipes ("candy canes") for looseness or fuel leaks at the connecting nuts.
- Verify proper crankcase vacuum.
- Inspect the air start distributor for leaks.
- Inspect the rocker arm lube oil pump and the rocker arm lube oil duplex strainer for leaks.
- Proceed along the right bank toward its turbocharger, repeating steps 13-15 for its cylinders.

In addition to the post-start checks, areas that should be routinely monitored during engine starts and operation are:

- Injection pump-to-header "fuel boxes"
- Upper and lower rocker arm covers.
- Rocker arm push-rod O-Rings.
- Cam covers.
- Fuel injection pump piping "dog leg".
- Fuel conduit.
- Fuel leak-off sight flow indicators.
- Crankcase covers.

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**POST START CHECKS FOR FAIRBANKS-  
MORSE DIESEL ENGINES**  
**(TYPE FM 38D8-1/8)**

By LCDR Dan Lane, ENCM (SW) Benedicto  
and ENCS(SW) Leppelman

Ref: (a) SSDS/0516/020698 for LSD-41/49 Class.  
(b) NAVSEA S9311-CT-MMA-010/8279, Ship Service Diesel Generator Maintenance Manual  
(c) NAVSEA S9311-AQ-MMA-010, 1300 KW Diesel Engine Generator Set

Reference (a) and sections 2.3 through 2.5 of reference (b) contain detailed pre-start checks and alignment procedures for Fairbanks-Morse diesel generator engines. This article provides suggestions for conducting effective standardized post-start inspections of these engines.

A thorough visual inspection of the engine, generator and its support systems should be conducted on both levels immediately after starting the engine as well as periodically throughout the watch. Look for fuel, lube oil, exhaust gas and cooling water leaks. A flashlight, clean rags and an inspection mirror can make this task easier.

- Start air should have shut off at the normal preset to prevent excess air flask pressure loss.
- Verify that the pressures and temperatures of the various fuel, oil and water cooling systems are normal for the operating conditions and report them
- Verify that the exhaust temperatures are normal and nearly equal for all cylinders. Check abnormal temperatures using reference (b), Table 2-2.
- The Auxiliary Enclosed Operating Station or Electrical Plant Control Panel operator should also check fuel, lube oil and cooling water system pressures and temperatures IAW reference (b).

For the physical inspection of the engine:

- Immediately report any unusual noises, vibrations or other indications to the EOOW.
- Start the inspection at the drive/blower end on the lower level. Proceed around the engine in a 360-degree counter-clockwise arc (as seen from above) checking for evidence of cooling water, lube oil or fuel leakage or any other unusual conditions.:

- Be alert for unusual smells that would indicate fuel, exhaust or lube oil leaks.
- Check the SSDG duplex lube oil strainer for evidence of internal leakage.
- Check the SSDG lube oil cooler for leaks.

#### Generator End

- Look through the generator inspection window (if installed), checking for arcing or other evidence of malfunction.
- Check the PMA for excessive heat or noise.
- Verify oil flow through the generator lube oil flow sight gage (beneath the PMA).
- Check the generator air cooler telltale drain for evidence of internal leakage.

#### Drive/Blower End (Right Side)

- Check the SSDG lube oil circulation pump and heater for lube oil leaks.
- Check the generator bearing oil supply Sight-Glass for flow.
- Check the generator bearing oil supply relief valve for leaks.

#### Engine Right Side

- Inspect each cylinder assembly and its vicinity for the following:
- Check the start air distribution connections for leaks *while starting the engine*.
- Check for fuel leaks from the fuel inlet and return headers and the fuel injector connections.
- Inspect each lower and upper crankcase cover for lube oil leaks.

#### Control/Exhaust End (Right Side)

- Inspect the air start distributor as well as its supply and return lines for leaks.
- Check for jacket water leaks at the air start saver valve.
- Stop and carefully examine the exhaust end from the bilge to the engine upper half. (this area has a large number of potential leak-sources):
  - lube oil priming pump discharge
  - attached lube oil pump discharge
  - attached fresh water pump discharge
  - jacket water header connections
  - attached seawater pump discharge
- Look for exhaust leaks at the left and right side exhaust manifolds and up along the exhaust duct.

#### Control End (Left Side)

- Check the tach-magneto generator, emergency shutdown trip lever and reset lever for evidence of damage or malfunction.
- Carefully inspect the governor and the fuel piping beneath it for lube or fuel leakage.
- Verify that the governor control lube oil sight-glass is filled IAW PMS and not leaking. The indicated rack setting should correspond to engine load.
- Check the duplex fuel oil strainer for fuel leaks both from the baskets and the equalizing valve assembly.

#### Engine Left Side

- Proceed back towards the drive end, repeating step 11 for the left side.
- Inspect the crankcase vacuum line oil separator for leaks.
- Check the lube oil sump dipstick for leaks, ensuring it is fully inserted and seated.
- Check for oil pooling beneath the flywheel and engine-generator coupling.

Proceed to the upper level and continue above right/control side at the drive/blower end (above the generator):

#### Upper Level

- Verify normal conditions at the IC alarm panel.
- Check the static exciter for evidence of malfunction or overheating (once the SSDG has been electrically loaded).
- Continue along the right-side inspecting each upper crankcase cover for leaks and looseness. (The exhaust covers may leak lube oil under low loads.)
- Check the Jacket Water Expansion Tank level (normally between  $\frac{1}{2}$  and  $\frac{3}{4}$ ).
- Proceed around the engine along the left side and back towards the drive end, repeating step 3 for the left side.
- Check fuel, lube oil and cooling water pressures at the Local Control Panel and report them to EOOW.
- Verify proper crankcase vacuum, (nominally 0.5 to 2.0 (maximum) inches of water).
- Verify proper engine air intake pressures.

**POST START AND WATCH-TO-WATCH**  
**VISUAL CHECKS FOR DETROIT-ALLISON**  
**16V149 ENGINES (FFGs)**

By LCDR Curtis Lenderman

SSDG's should be inspected upon start up and periodically throughout the watch. This article provides some suggestions for conducting effective post-start and periodic inspections.

Two tools that are a must are a flashlight (for obvious reasons) and an inspection mirror for inspecting the fuel oil manifold, especially on NR 4 SSDG, which is more difficult to inspect due to its height. A clipboard with a laminated check list is also strongly recommended. The following list of checks are provided as a good start.

- Verify that the pressures and temperatures of the various fuel, oil and water cooling systems at the Local Operating Station are normal for the operating conditions and report them to the EOOW.
- Verify that the exhaust temperatures are normal and nearly equal for all cylinders.
- The AEOOW should also check fuel, lube oil and cooling water system pressures and temperatures in CCS.
- Verify lube oil flow through generator bearing sight flow indicators.
- Check the fuel manifold connections (middle and ends) for leaks. Ensure that both the supply and return fittings are inspected.
- Check the fuel fittings on the fuel system Detroit Switches (forward end of the engine).  
Check the braided flex hoses above the fuel filters for leaks at the fittings and for chafing.
- Look inside the fuel filter fire-safe box for leaks and pooling. Ships frequently find that the fuel filter vent valve flare fittings loosen over time causing leaks into the fire-safe box.
- Inspect the top and bottom of the knife-edge fuel strainers for leakage. There should be no noticeable slop or leakage at the rotating stems.
- Inspect the lube oil strainers and lube oil hoses for leaks.
- Inspect the turbocharger lube oil supply lines for leaks.
- Inspect the jacket water manifold and hoses for leaks, and verify the jacket water expansion tank level.

- Check for lube oil pooling under the engine and within the A-frame. Ensure A-frame guards are in place.
- Verify that the alarm panel is in the audible alarm position.
- Check for lube oil leaks at the:
  - Governor control line.
  - Air Box Covers.
  - Valve Covers.
- Observe the Generator through the sight glasses for arcing/sparking.
- Ensure the turbocharger lagging pads are in place and that there is no evidence of exhaust leaks (excessive soot build-up, strong smell of exhaust, and heat build-up in the SSDG enclosure).
- For SSDGs with Start Air Compressors, inspect the SAC lube oil cooler for leaks, and check for oil leaking from the numerous flare fittings and the SAC air intake (use caution when handling 23699 Synthetic Lube Oil). If leaks are present, verify the SAC lube oil level. Lube oil leaking from the air intake is often caused by overfilling while secured.

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**DAMAGE CONTROL/  
FIREFIGHTING**

**FIREFIGHTING**

**MCM/ MHC MACHINERY SPACE**  
**FIREFIGHTING**

By LCDR Chuck Smith

Ref: (a) NSTM 555

Paragraph 555-8.6 of reference (a) provides specific guidance for MHC and MCM class ships machinery space fire fighting. This article provides an overview of this guidance along with some other MCM/MHC unique issues that commanding officers may want to include in the ship's main space fire fighting doctrine.

For MCM Class ships reference (a) identifies the three separate systems available for fighting fires (HALON, AFFF and overhead sea water sprinkling), and discusses the situations for which each is designed. It also provides specific guidance for those situations when space evacuation is required.

Some other issues you may also want to consider are:

- Who can authorize activation of overhead seawater sprinkling?
- When use of the overhead seawater sprinkling is warranted, should complete electrical isolation (including lighting) be required prior to activation?
- Should zebra be set on the firemain system for a machinery space fire?

MHCs are unique in that the diesel engines are housed in acoustic enclosures. Reference (a) provides separate guidance for combating a fire confined to an engine enclosure and a fire outside the enclosure. Paragraph 555.8.6.3.1 states that "other equipment and engines in the same machinery space may continue to be operated if the fire is confined to within one engine enclosure". Also, because the MHC AFFF sprinkling systems are combined with nozzles in the overhead and bilge areas, the guidance for AFFF activation is different for a fire confined to an enclosure.

Some other issues you may also want to consider are:

- Using the access panel at the front of the diesel enclosures (if installed) to apply AFFF to the leak or fire rather than opening the side access doors which might allow the fire to spread.

- On most MHCs, electrical isolation of the AMR will secure power to the cooling fans for 1A and 1B SSDG and electrical isolation of the MMR will do the same for NR 2 SSDG. You may want to provide specific guidance in your MSFD to shift to 2 SSDG for an AMR fire and 1A or 1B SSDG for a MMR fire.
- When use of the overhead AFFF sprinkling is warranted, should complete electrical isolation (including lighting) be required prior to activation?
- Who can authorize activation of overhead AFFF sprinkling?
- In a HALON good, fire inside enclosure scenario mechanical and electrical isolation should not be ordered, or should be modified so that online equipment will not be affected.
- How would you combat a fire in the VSP room? The VSP room contains a large amount of oil under pressure and presents some unique firefighting challenges (only one reentry route, lack of HALON/AFFF, need to electrically isolate 1 or 2 UPS units).
- Should zebra be set on the firemain system for a machinery space fire?

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### **PILFER-RESISTANT "STEALTH" HELMET LIGHTS**

By LCDR Dan Lane

As you probably know, the new "Stealth" helmet lights are compact, reliable and deliver increased illumination when compared to older lights. Unfortunately, these same qualities make them very attractive for use as flashlights and they have consequently become very "pilferable".

HT1 (SW) Greg J. Larsen and ENS Jason R. Miller of USS UNDERWOOD (FFG-36) have developed an innovative "pop-riveting" solution to this problem.

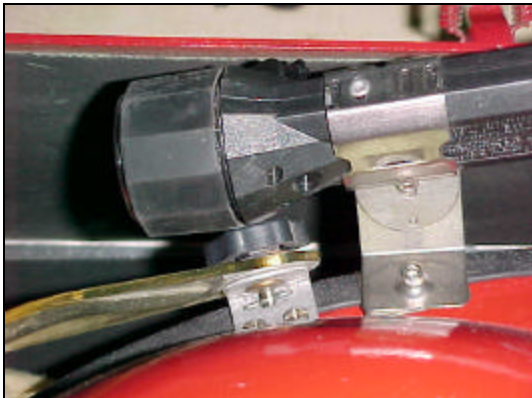
1. Remove the AA batteries from the light.

2. Slide the Stealth light as far back on its bracket as possible.
3. Drill one (1) one-eighth inch hole in the second slot forward of the bracket.
4. Install one (1) one-eighth inch rivet with a one-eighth inch shank.
5. Re-install the AA batteries to ensure proper clearance with the rivet installed.
6. If the batteries do not clear the rivet, grind the excess of the shank down with a Dremmel-tool.

Figures (1) and (2) show the final appearance of a Stealth light with the completed modification.



**Figure 1 - Stealth Light Modification - Top Overview**



**Figure 2 - Stealth Light Modification - Top View Close-Up**

Another noted problem is that the mounting screws on the bracket tend to loosen over time. HT1 Larsen and ENS Miller recommend applying Lock-Tight compound or Super-Glue to the threads to prevent this.

## DAMAGE CONTROL

### A GOOD DCTT BRIEF

By CDR J. A. Roos

As you probably realize, we at ATGLANT N43 have the pleasure of observing many DCTT Briefs. Recently, it was my pleasure to observe one of the best drill briefs I have ever seen. The ship was the USS SENTRY (MCM-3) and I thought I would share with you the key elements that set this brief apart.

The first element of the brief was to identify the level of knowledge of the Repair Party and the purpose of the drill. In this case, the level of knowledge was considered basic with no prompting allowed. Seven objectives were identified. For example, the ship identified the specific objective to "Assess in-space watchstander's ability to conduct initial actions and fight the fire as trained." What made this brief better was that they also included a detailed description of the actions expected (i.e. Report, deflect, isolate leak, man fire fighting equipment, and fight fire to include keeping control of portable bottles, hose handling and proper battle dress). The final objective was to observe improvement of the DCTT and Repair Party based upon lessons learned from the previous drill.

The next portion of the brief identified the DCTT along with a detailed description of each DCTT member's responsibilities. For example, the DCTT OSL's responsibility was to "observe the coordination/procedures of the Scene Leader. Report when fire party is manned and ready and observe proper fire fighting procedures, activation of HALON and the OSL's performance."

Next the ship provided a detailed description of the Ship's Condition/Location and Situation, safety concerns with specific duties assigned to certain members such as the "Torch" DCTT ensuring safety on the ladders, and any electrical or mechanical isolation exceptions.

The best part of the brief was how the ship divided the drill into separate phases with

specific “events” along with the “method of disclosure” discussed for each event. Methods of disclosure included a full discussion of what indications would be present, what props would be used and by whom.

Phase one was the “Fire and Evacuation” phase which included events 1-9. Event 1 was the fire, which would progress to out of control; Event 2 use of “portable DC extinguishers; Event 3 the evacuation; Event 4 activation of AFFF and HALON; Event 5 black smoke coming from the stack; Event 6 pulling of mechanical trips (fuel, air); Event 7 EOOW's actions; Event 8 Primary HALON effectiveness ; Event 9 Secondary HALON effectiveness (if necessary).

Phase two was “Entering the Affected Space” including events 10-19. Event 10 was preparation of atmospheric test equipment; Event 11 activation of hoses; Event 12 testing of agents; Events 13 and 14 activation of overhead sprinkling in event of HALON bad; Events 15 and 16 activation of AFFF for two minutes prior to reentry; Event 17 reentry; Event 18 fire fighting efforts of attack team; Event 19 verification of vapor bearer in bilge.

Phase three was “Post Fire Actions” including events 20-24. Event 20 was overhaul gear brought to scene; Event 21 overhaul procedures of the overhaul team; Event 22 finding and combating hang fires; Event 23 OBA relief and turnover; Event 24 Desmoking.

The brief concluded with a discussion of risk assessment and specific safety concerns (hearing protection near P-250 pump; two men opening hatch; one man on ladder at a time; heat stress concerns; actions in case of actual casualty etc.

What I liked best about this brief was its detail. Obviously a lot of work and thought went into its preparation. The end result was a brief that could be used again and again as a valuable training tool.

By LCDR WEICKSEL

The ship's main drainage system is a vital damage control tool. Here are some common discrepancies noted during engineering assessments:

1. Ship's are unable to align eductors or operate bulkhead isolation valves remotely because of broken or disconnected remote operators (mechanical, hydraulic or teleflex).
2. Inoperative firemain supply or eductor suction gages (broken or misaligned) which prevent the operator from verifying vacuum prior to opening the suction valve.
3. Eductor firemain supply valves leak by such that firemain pressure is indicated on the eductor supply and/or suction compound pressure gage.
4. Unable to develop vacuum with the eductor overboard discharge and firemain supply valve open.

As you are preparing your availability work packages early assessment of the ship's main drainage system will help ensure this vital damage control system is maintained in good repair. The following is recommended:

- Operate all valves remotely. Ensure valves cycle through their entire range without binding or seizing.
- Observe eductor supply and suction gages with the eductor secured. Any indication of pressure means the firemain supply valve is leaking by.
- Align each eductor for operation leaving the suction valves closed. Observe local and remote suction and vacuum gages for proper operation. The amount of vacuum observed indicates suction valve and piping integrity. Zero inches of vacuum is not acceptable.

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## **MAIN DRAINAGE SYSTEMS**

# ADDENDA PAGE

## ENGINEERING LOG CHECK SHEET

Date of Engineering LOG:

ITEM	Y	N	NA	REMARKS
1. Is the heading complete?				
2. Are main engines in use listed?				
3. Is the plant status listed?				
4. Generators in use and in parallel listed?				
5. Steering engine combination listed?				
6. Days out of dry-dock listed?				
7. Day since last hull cleaning listed?				
8. Draft indicated listed?				
9. Liquid load listed?				
10. Equipment out of commission (components which affect the overall operation of the ship by placing a limitation on the performance or flexibility)				
11. Total distance through the water listed?				
12. Unused blocks crossed out?				
13. Are engineering log and bell book classification blocks filled in?				
14. Complete chronological listing entered by watch of important events pertaining to the propulsion plant and principal auxiliaries?				
15. Personnel casualties?				
16. Equipment casualties with appropriate amplifying comments?				
17. Shifting of major equipment?				
18. Changing to and from maneuvering combinations?				
19. Beginning and ending major evolutions?				
20. Shifting lube oil strainers?				
21. Opening and inspecting main engines, generators and any changes therein?				
22. Disposition and changes in principal auxiliaries which affect main machinery operation?				
23. Conditions of high heat and humidity?				
22. Data to support the receipt and transfer of the liquid load?				
23. Inspections conducted by the engineering officer.				
24. Results of operational tests, inspections, placing equipment into or out of commission?				
25. Are errors properly corrected?				
26. Are remarks being prepared and signed by the EOOW/EDO before being relieved?				
27. Are the logs receiving a meaningful review?				
28. Do watch officers review the legal records back to when they last had watch as part of their relief? (U/W)				
29. Does the OOC list in the Engineering Log accurately reflect OOC equipment listed in the Tag out Log?				
30. Is the Daily Nitrite Test logged and note time?				
31. How many SAC engagements and note start times?				
32. List times of GTE starts/stops				

Reviewed by:

EOOW (0200-0700)/EDO (rev watch) \_\_\_\_\_ MPA \_\_\_\_\_ CHENG \_\_\_\_\_

